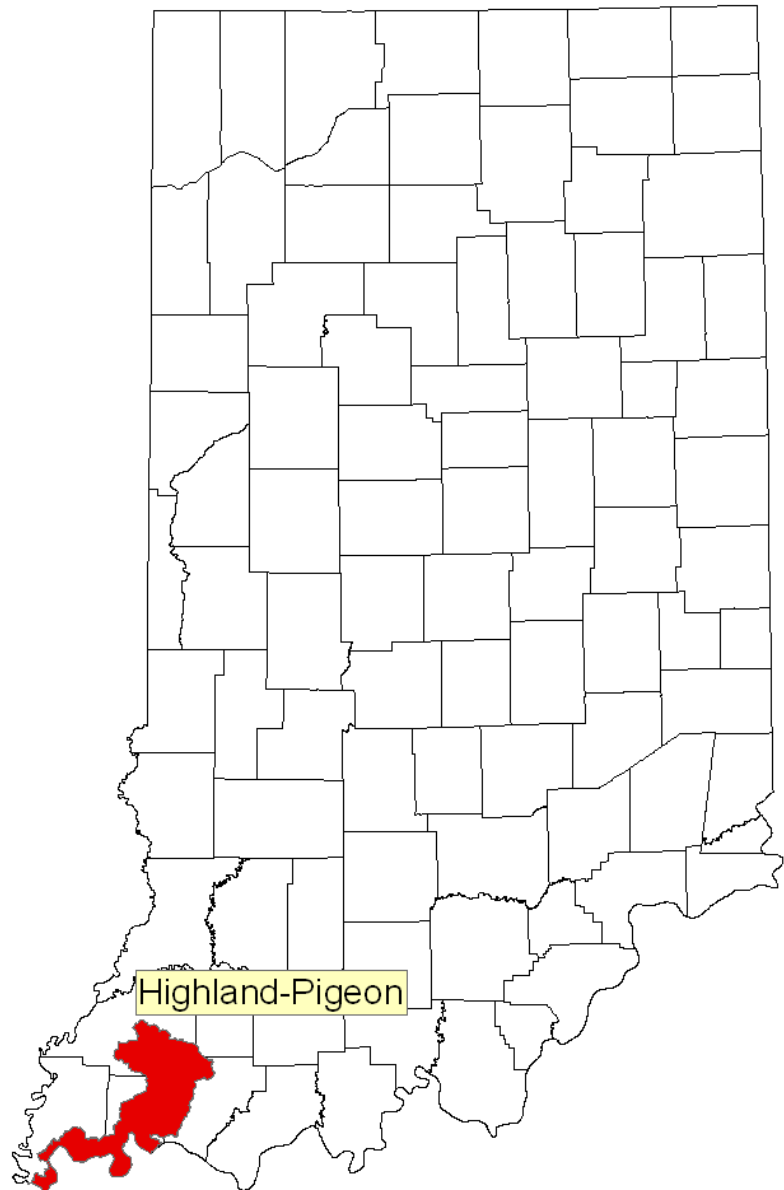
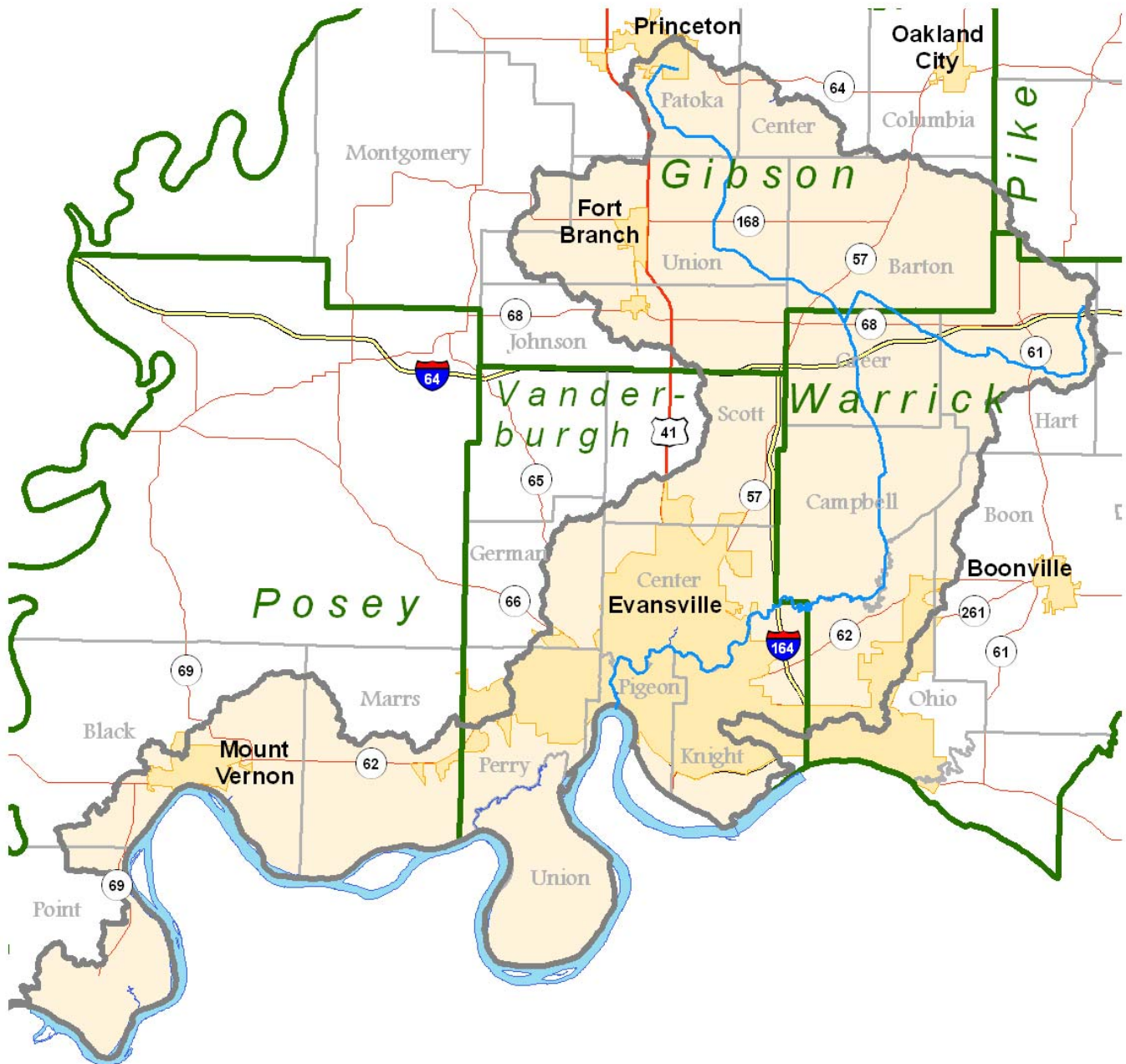


Rapid Watershed Assessment Highland-Pigeon Watershed

Rapid Watershed Assessments provide initial estimates of where conservation investments would best address the concerns of land owners, conservation districts, and community organizations and stakeholders. These assessments help land owners and local leaders set priorities and determine the best actions to achieve their goals.



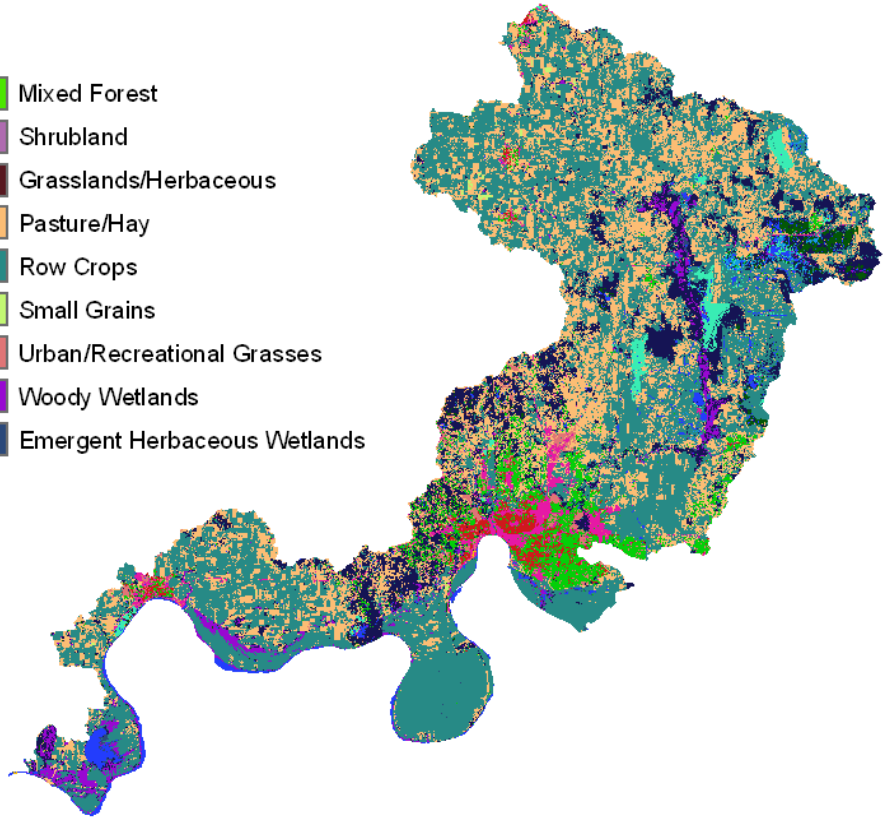
Highland-Pigeon Watershed



Introduction

The Highland-Pigeon watershed is an eight digit (05140202) hydrologic unit code HUC) watershed in the lower southwest corner of Indiana. The watershed drainage area is approximately 250,000 acres located in five different counties. It is subdivided into 44 subbasins represented on the map by 14 digit HUCs (Figure 2-1). The primary waterbody is Pigeon Creek, which originates in Gibson County and flows south through Warrick and Vanderburgh Counties, and discharges in the Ohio River.

Land Cover



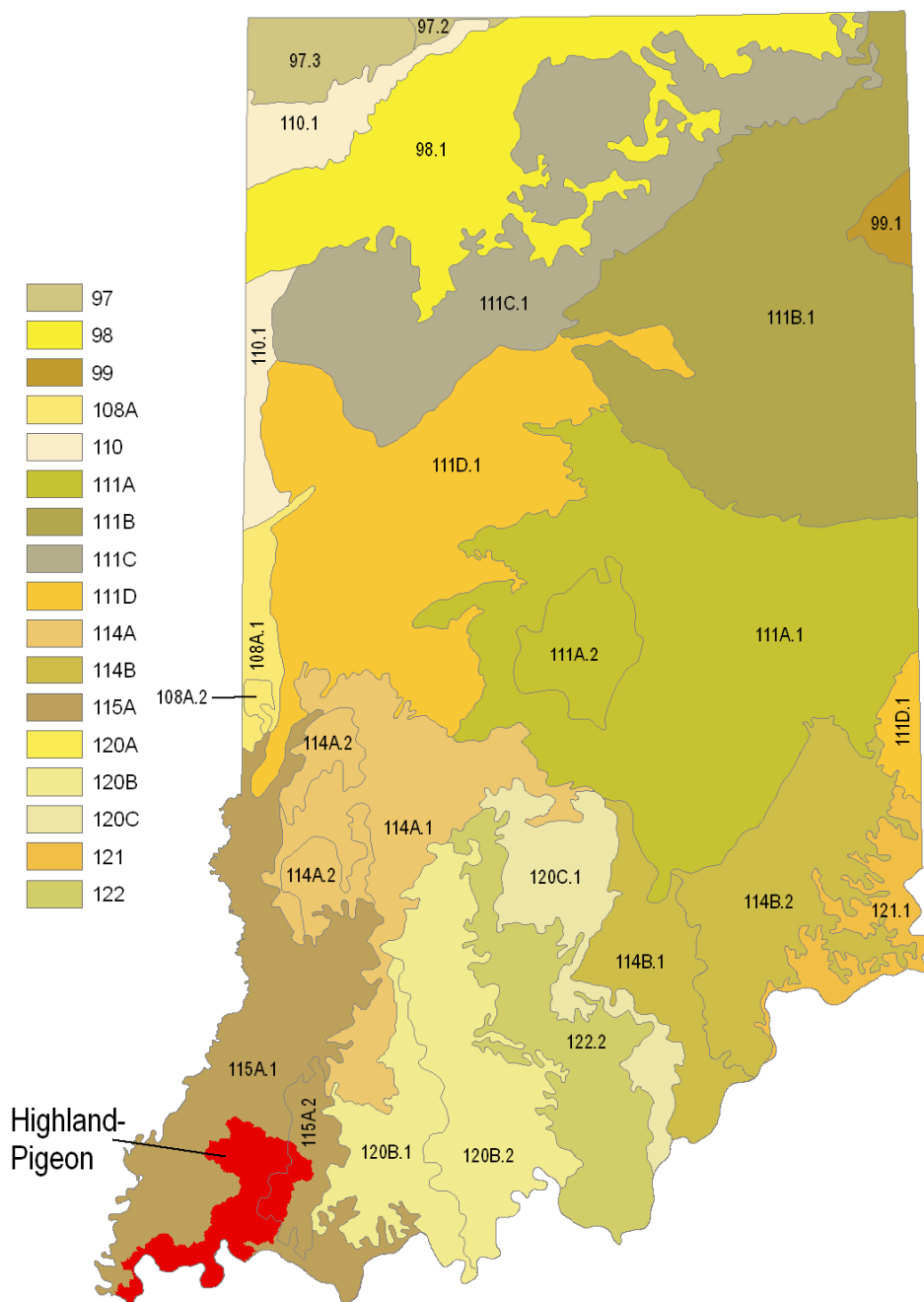
The landscape changes from moderately steep in the north, to gently rolling terrain in the south. Flooding occurs annually in the bottomland located along the Ohio River. The largest water impoundment in the watershed is Hovey Lake, a natural lake 1,400 acres in size. Evansville is the largest metropolitan area in the watershed.

Common Resource Area

There are two common resource areas in the watershed:

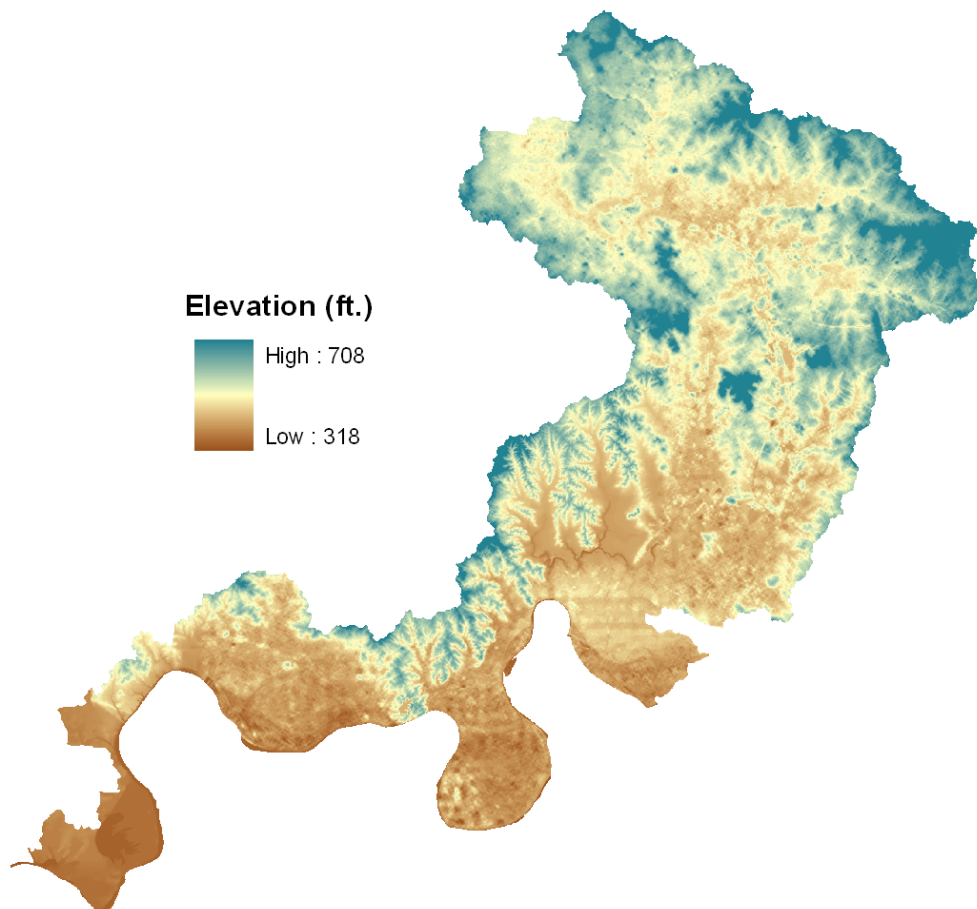
The Interior River Lowland Central Mississippi Valley Wooded Slopes, Easter Part (115A.1). This CRA is characterized by Wabash bottomlands along the lower Wabash and Ohio Rivers. Low, nearly level flood plains, terraces, and bayous are composed of alluvial and outwash deposits. Hardwood forests dominate in the woodland that remains. Corn, soybean, wheat, alfalfa, or livestock farming are dominate. Soils are very poorly drained to well drained, formed in loamy and silty alluvial and lacustrine sediments.

The Mined subsection – interior River Lowland Central Mississippi Valley Wooded Slopes, Eastern Pare (115A.2). This CRA is characterized by glaciated Wabash lowlands, often mantled by till or windblown silt and sand. The loamy to sandy till deposits are pre-Wisconsinan age, older and leached. Extensive mining operation, permanent pasture and man-made lakes are dominate. Some woodland and urban development has occurred in older mined areas. Compaction and erosion are concerns. Soils are very poorly drained to excessively drained, formed in silty to sandy glacial deposits.

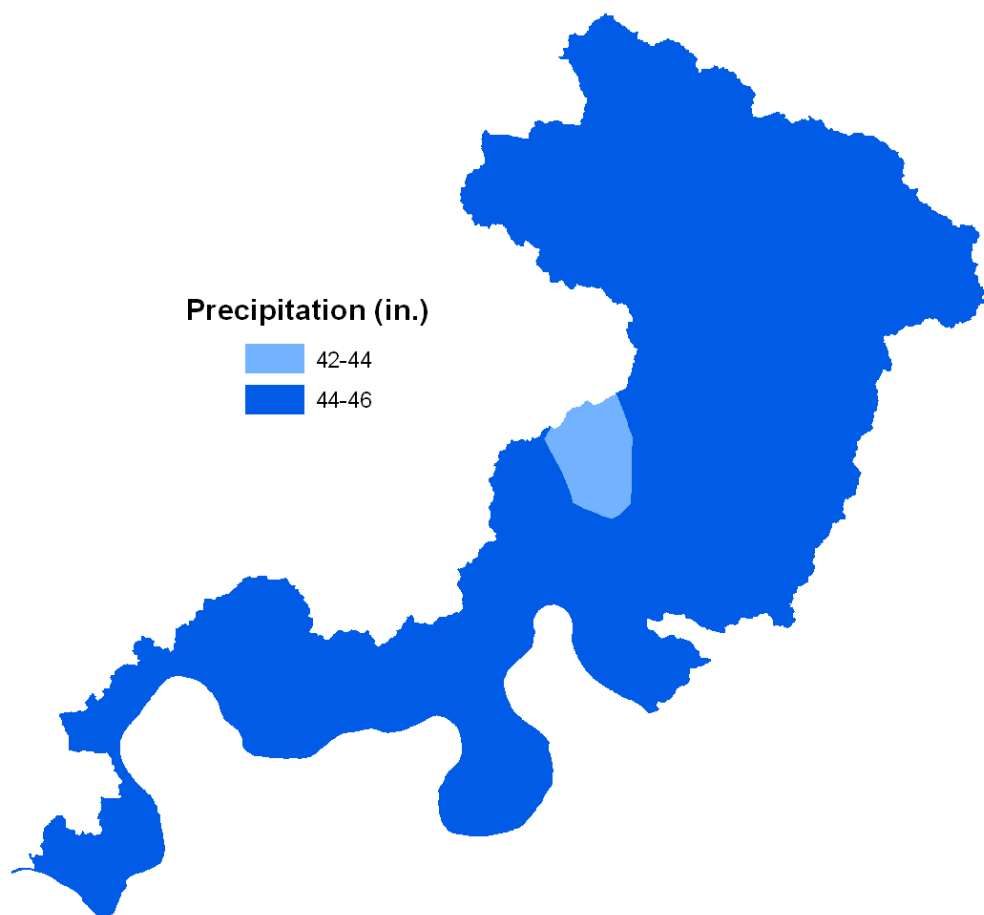


Physical Description

The Highland-Pigeon watershed is located in the lower Southwest corner of Indiana. The primary waterbody is Pigeon Creek, which receives rainfall runoff from approximately 250,000 acres from five different counties.



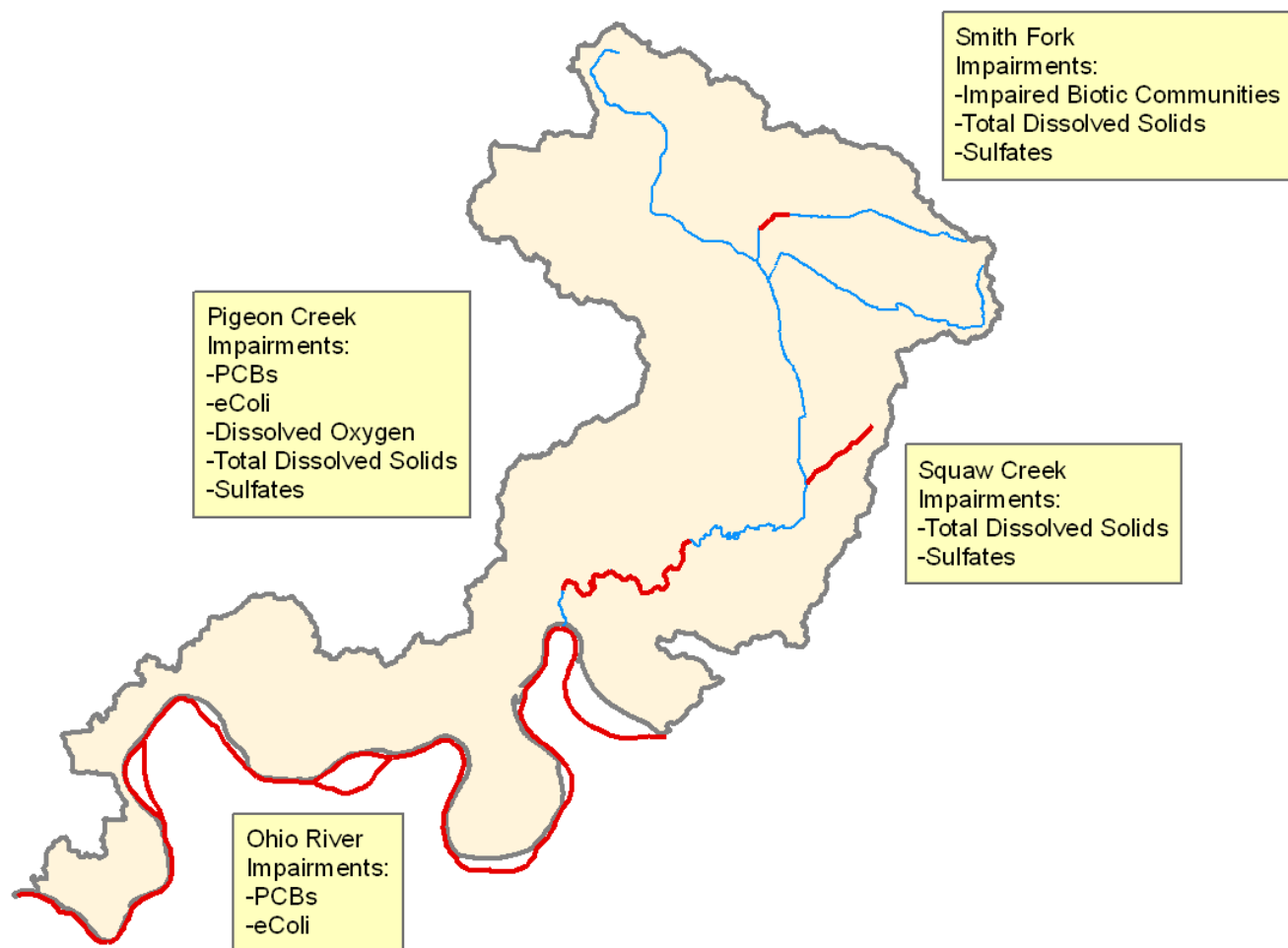
Pigeon Creek originates in Gibson County and travels south through Warrick and Vanderburgh Counties, eventually discharging in the Ohio River. The landscape changes from moderately steep in the north, to gently rolling terrain in the south. Flooding occurs annually in the bottomlands located along the Ohio River.



Assessment of waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. The Clean Water Act Section 303(d) list for Indiana provides a basis for understanding the current status of water quality in the Highland-Pigeon Watershed.

WATERBODY SEGMENT ID	WATERBODY SEGMENT NAME	CAUSE OF IMPAIRMENT
INH8_M01	OHIO RIVER - EVANSVILLE TO UNIONTOWN	E. COLI
INH8_M01	OHIO RIVER - Evansville to Uniontown	FCA for PCBs
INH9_00	OHIO RIVER - UNIONTOWN TO WABASH R	E. COLI
INH9_00	OHIO RIVER - Uniontown to Wabash R	FCA for PCBs
INH8_00	OHIO RIVER - GREEN RIVER TO EVANSVILLE	E. COLI
INH8_00	OHIO RIVER - Green River to Evansville	FCA for PCBs
INE0227_T1030	SMITH FORK	IMPAIRED BIOTIC COMMUNITIES
INE0227_T1030	SMITH FORK	SULFATES
INE0227_T1030	SMITH FORK	TOTAL DISSOLVED SOLIDS
INE0235_00	SQUAW CREEK	SULFATES
INE0235_00	SQUAW CREEK	TOTAL DISSOLVED SOLIDS
INE0241_T1001	PIGEON CREEK	FCA for PCBs
INE0248_T1002	PIGEON CREEK-HARPER DITCH	DISSOLVED OXYGEN
INE0248_T1002	PIGEON CREEK-HARPER DITCH	E. COLI
INE0248_T1002	PIGEON CREEK-HARPER DITCH	FCA for PCBs
INE0248_T1002	PIGEON CREEK-HARPER DITCH	TOTAL DISSOLVED SOLIDS
INE024A_T1003	PIGEON CREEK-KLEYMEYER PARK	DISSOLVED OXYGEN
INE024A_T1003	PIGEON CREEK-KLEYMEYER PARK	E. COLI
INE024A_T1003	PIGEON CREEK-KLEYMEYER PARK	FCA for PCBs
INE024A_T1003	PIGEON CREEK-KLEYMEYER PARK	SULFATES
INE024A_T1003	PIGEON CREEK-KLEYMEYER PARK	TOTAL DISSOLVED SOLIDS
INE024C_T1004	PIGEON CREEK	FCA for PCBs
INE02P1017_00	HOVEY LAKE	FCA for PCBs



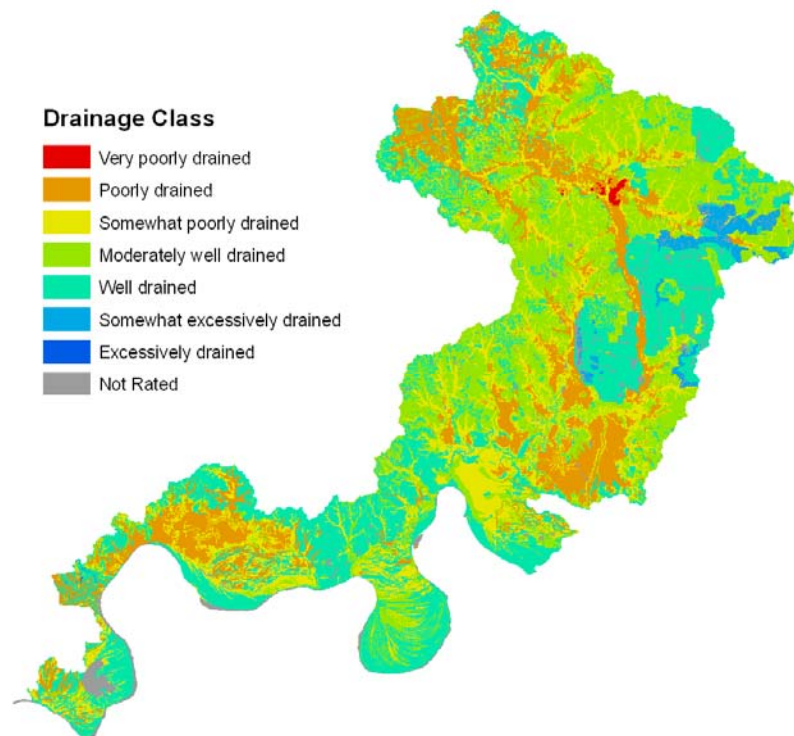
Soils

The Highland-Pigeon watershed covers a large landscape of various landforms. The area is underlain with sandstone and shale of Pennsylvanian age. The soils on the uplands are mostly formed from loess over sandstone and shale. The dominant soil types are Hosmer, Zanesville and Wellston. These soils are mainly used for cropland, and to a lesser extent pasture and woodland. Parts of Warrick, Vanderburgh and Posey Counties have large areas of lacustrine or lake bed terraces. The soils formed in slack water deposits of silts and clays. The dominant soil types are Zipp, Evansville and McGary. These soils are used mainly for cropland. Posey and Vanderburgh Counties also have areas of river terraces associated with the Ohio River. These areas consist of water deposited loamy and silty material underlain with sand. The dominant soil types are Weinbach, Wheeling, Elkinsville and Ginat. These soils are used mainly for cropland, and to lesser extent woodland and urban land. The flood plains in the area are either smaller tributaries associated with the uplands or broader areas along the Ohio River. The smaller tributaries are dominated by silty alluvium. The main soil types are Stendal, Wakeland, Bonnie or Birds. The soils along the Ohio River formed mostly from silty non-acid alluvium. The main soil types are mainly Huntington, Nolin and Newark. The major land use is cropland

Drainage

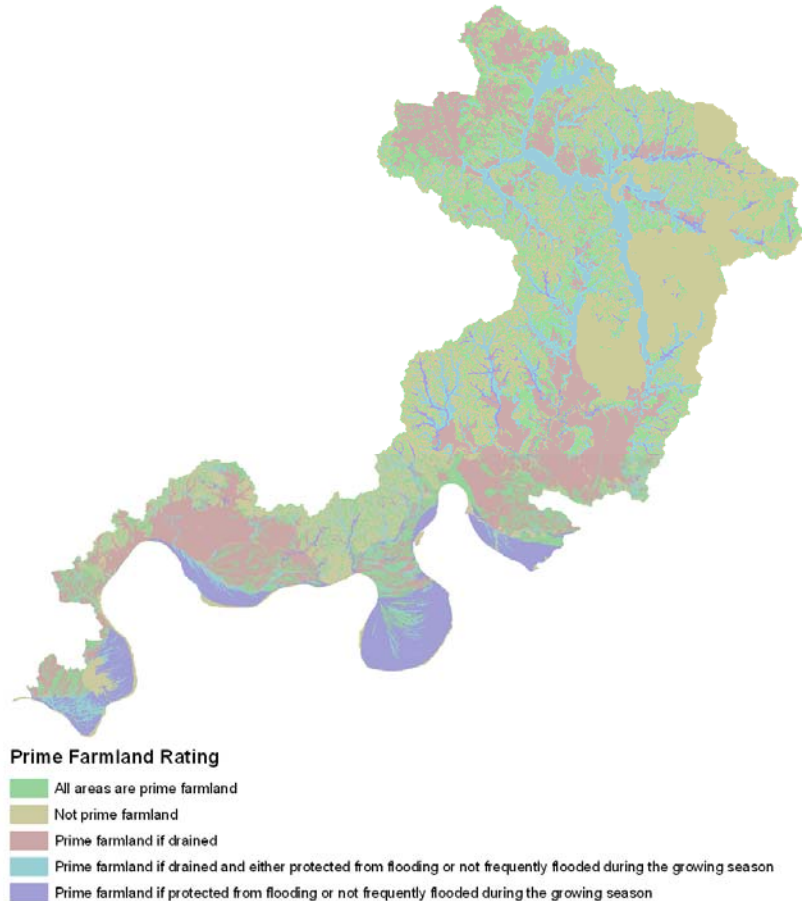
Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



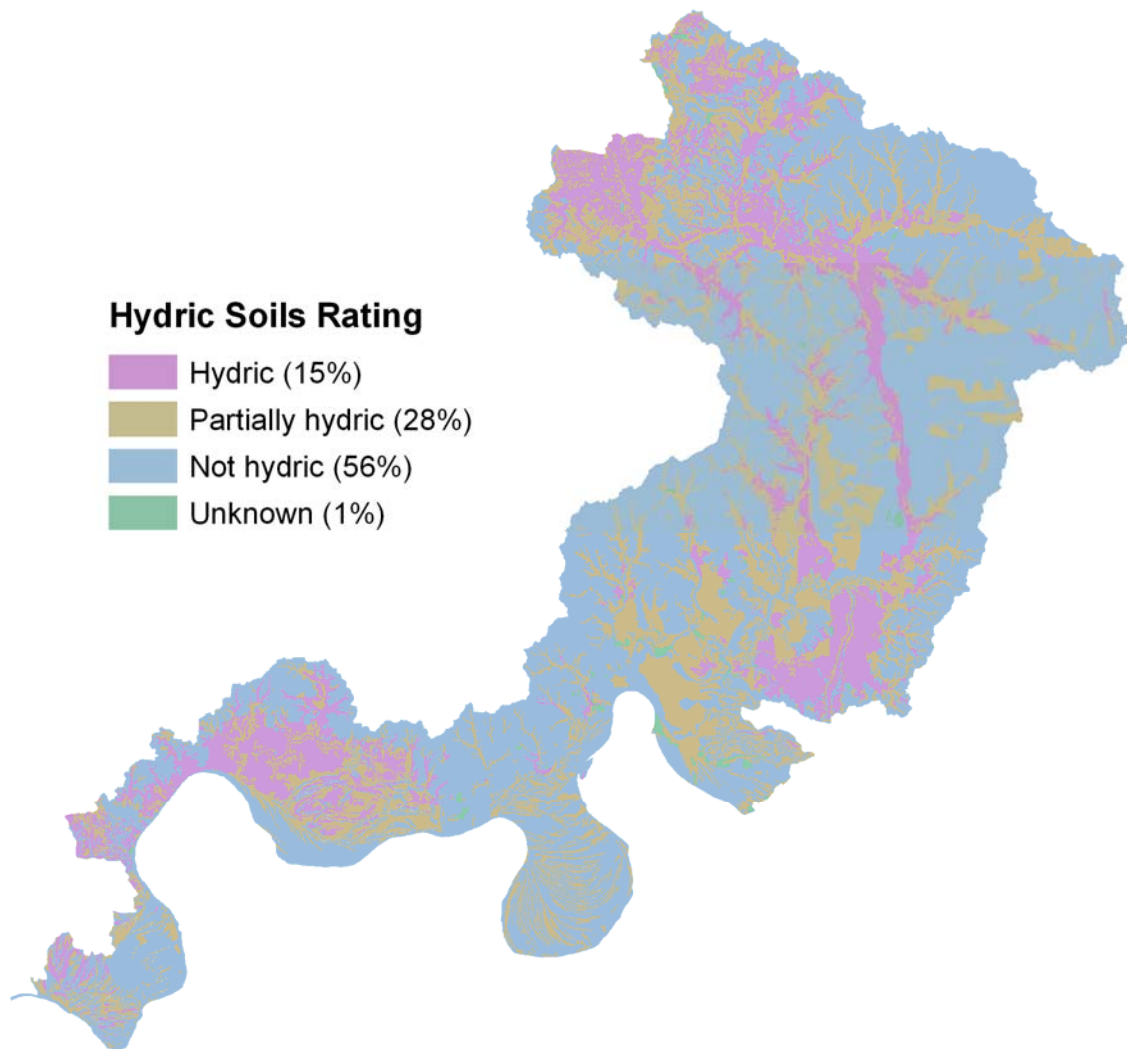
Farmland Classification Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland.

Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.



Hydric Soils This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions of non-hydric soils in the higher positions on the landform, and map units dominantly made up of non-hydric soils may have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.



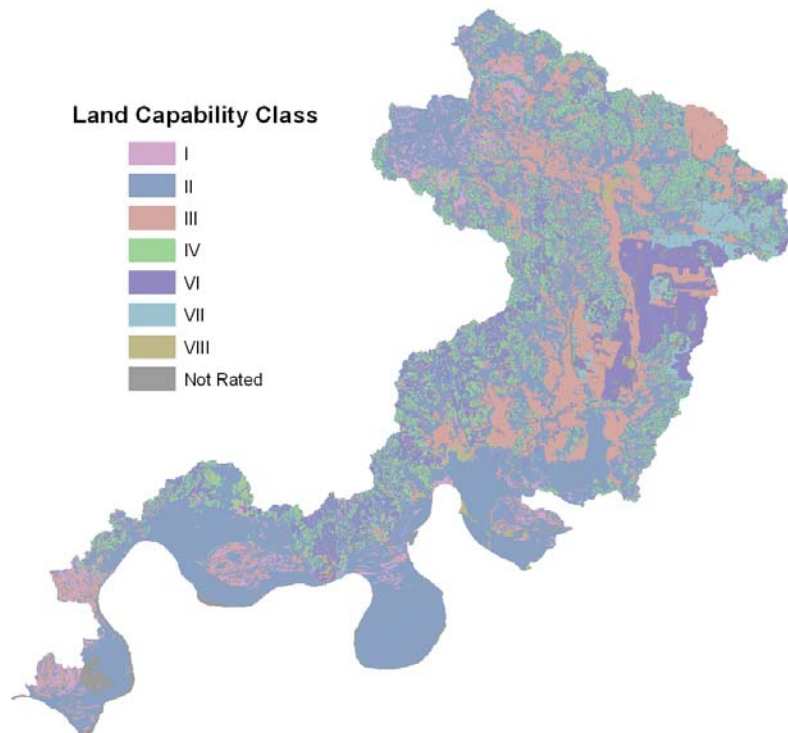
If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make on site determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

Highly Erodible Land (HEL)

A soil map unit with an erodibility index (EI) of 8 or greater is considered to be highly erodible land (HEL). The EI for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the FOTG as of January 1, 1990. Potential erodibility is based on default values for rainfall amount and intensity, percent and length of slope, surface texture and organic matter, permeability, and plant cover. Actual erodibility and EI for any specific map unit depends on the actual values for these properties.

Land Capability Classification

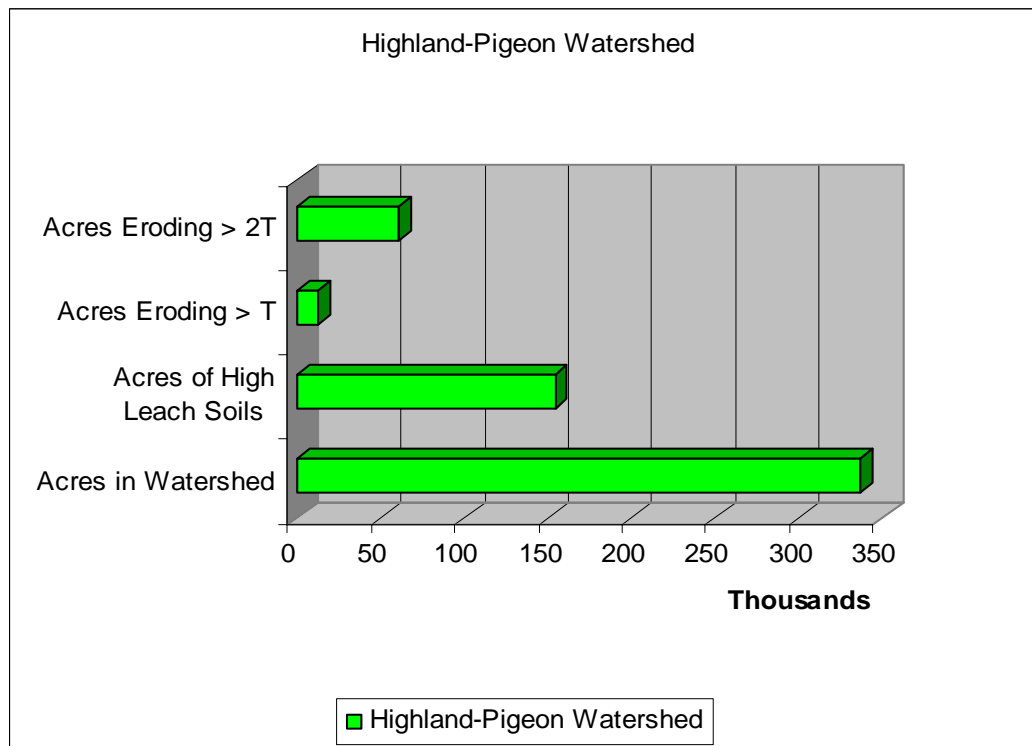
Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



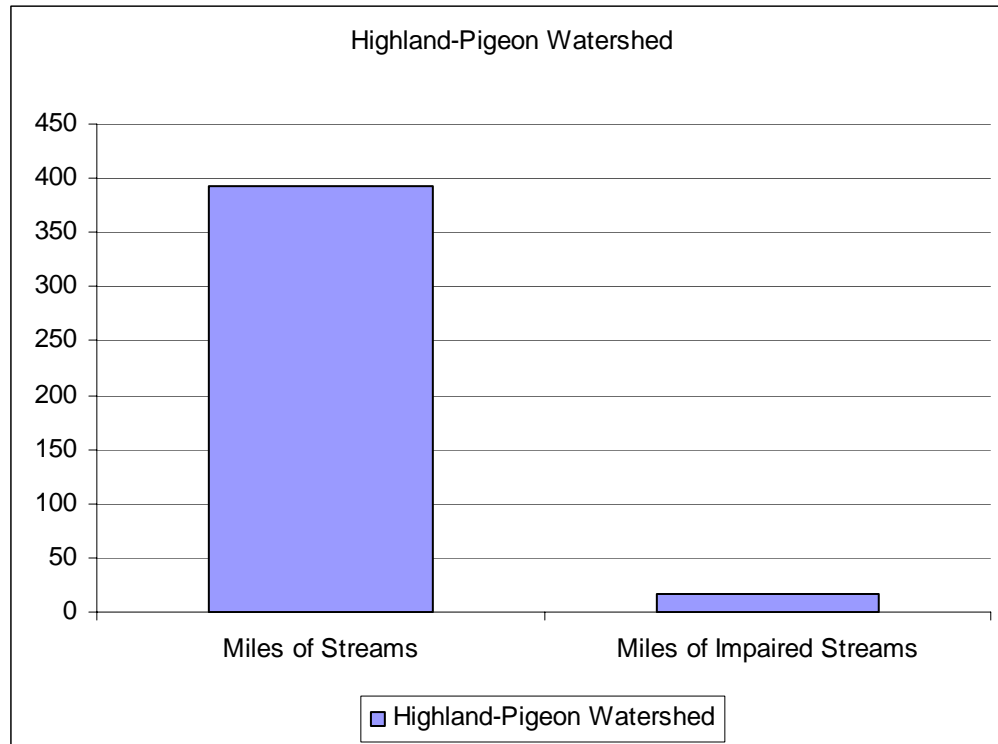
Resource Concerns

Stakeholders and electronic analysis have been identified the following resource concerns as being the top priority:

- Ground Water Quality - The watershed has in excess of 154,675 acres of soils with high leaching index (> 10) which allows containments on the land surface to be carried easily into the ground water from infiltrating water. Because of this condition, non-point pollutants such as fertilizers, pesticides, and livestock waste have the potential to contaminate the ground water aquifer.
- Soil Quality – The watershed has approximately 74,660 acres of soils eroding greater than the tolerable limit, of that, some 61,500 acres are eroding at twice the tolerable limit. Excessive Sheet and Rill Erosion and excessive gully, and streambank erosion rank high.



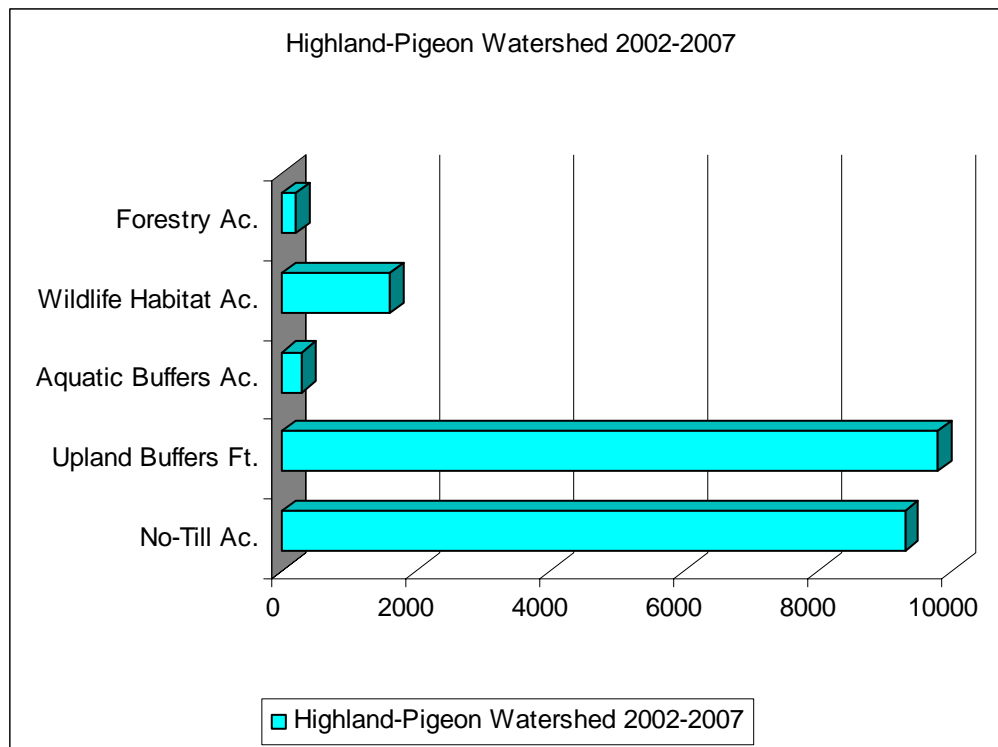
- Surface Water Quality – There is approximately 4 percent of the streams within the watershed that have identified impairments. Nutrients. Excessive amounts of sediments, nutrients, and bacteria degrade the water quality causing an unbalanced fish community with depressed populations and limited diversity.



- Threatened & Endangered Species – Just over 19 percent of the 337,377 acres in the watershed lie within the range of know Threatened and Endangered Species.
- The Environmental Protection Agency has identified 55.33 percent of the watershed as have an air quality concern.

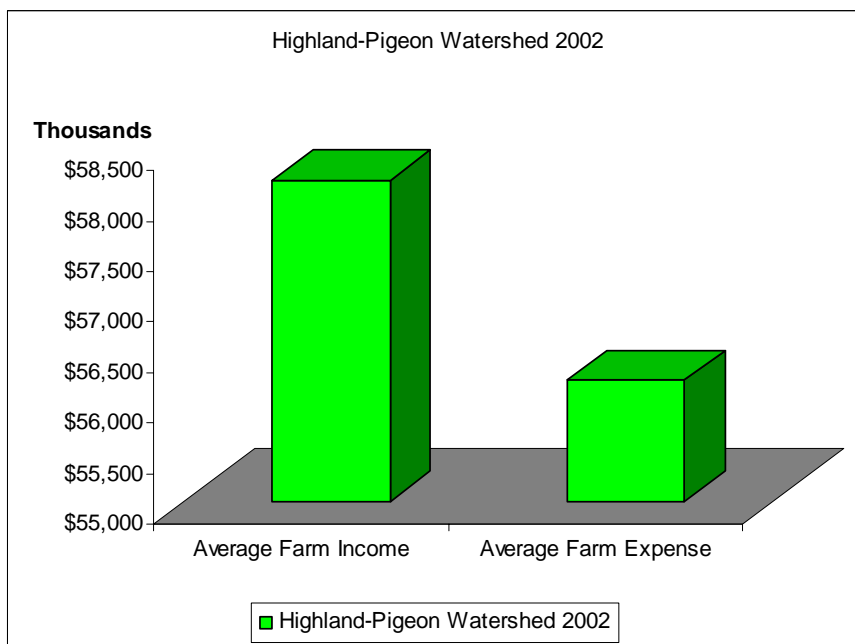
Performance Results System and Other Data

The producers within the watershed have implemented a variety of conservation practices over the past five years. Since 2002 through 2007 landowners have implemented over 9,300 acres of No-Till, approximately 9,800 feet of upland buffers, and just over 300 acres of aquatic buffers. Wildlife habitat has been improved or established on more than 1,600 acres within the watershed and just less than 200 acres of forestry practices have been applied.



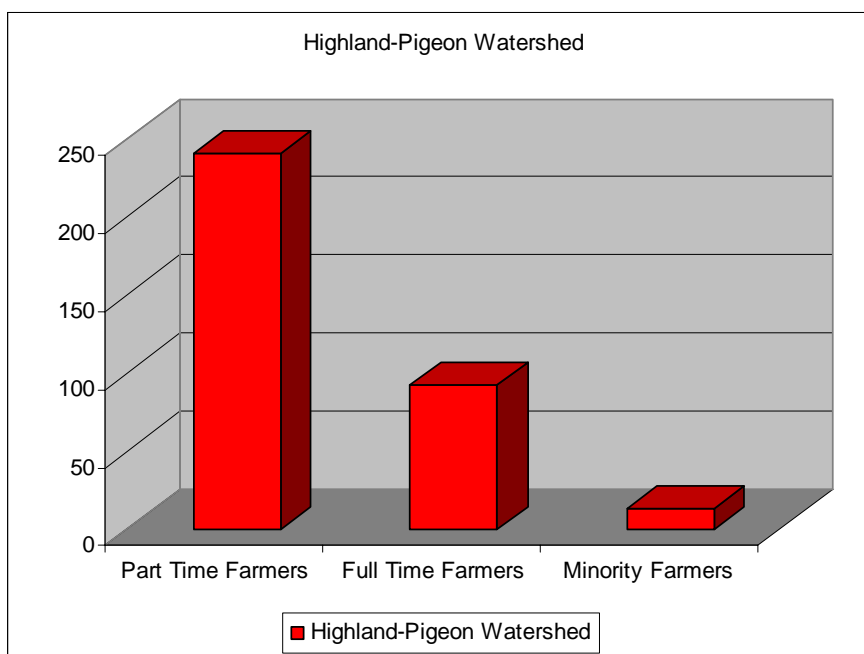
Census and Social Data (Relevant)

There are 589 farms in the watershed that average approximately 403 acres in size.



The 2002 average total farm income for all counties was \$58,185,000 while average expense was \$56,196,000.

There are approximately 240 part time farmers, 92 full time farmers and 13 minority farmers.



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Data Sources:

Indiana Common Resource Area (CRA) Map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a CRA.

Indiana Agricultural Statistics 2003 – 2004 - Indiana Agricultural Statistics, 1435 Win Hentschel Blvd., Suite B105, West Lafayette

Major Land Resource Area Map Tool - Indiana NRCS Soils Page -
<http://www.in.nrcs.usda.gov/mlra11/soils.html>

Indiana Hydrologic Units Indiana Geodata

Indiana Watershed Action Strategy Plan

Indiana Rapid Watershed Assessment (Electronic Data Sets – Web based application.

Indiana 2006 303d List – Indiana Department of Agriculture, Division of Natural Resources

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